Booklet #4

Booklet Series "Be in charge of your life cycle"

A ROOF OVER YOUR FUTURE: BUYING OR RENTING A HOUSE

ANGLE

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This booklet is number four in a series of five booklets that aim at improving economic and financial literacy of young people. Economic and Financial Literacy is basic knowledge possibly to be acquired early in life to make individual financial decisions better informed and more effective. This applies particularly to decisions that have long-term consequences and require thinking in terms of the individuals' complete life cycle. Although the five booklets are connected and refer to each other, each of them can be read independently of the others.

The first booklet in the series provides a general introduction on the concepts needed to make financial decisions over the life cycle. The other four booklets cover the most important economic decisions relevant at various stages of the life cycle. The second booklet is about educational choices, such as the decision when to leave school and enter the labour market or how much effort to invest in studying. Booklet 3 deals with the economics of saving and borrowing and what to do with money that is saved. Booklet 4 (this booklet) discusses many aspects of what is often one of the most important financial decisions in people's lives: the purchase and financing of their own house. Finally, Booklet 5 is about pensions and financial security after retirement.

The five booklets are part of the project "A network game for lifecycle education" (ANGLE), funded by the Erasmus+ programme of the EU. This project aims at promoting and enhancing Europe's younger generations' financial and economic literacy. It adopts a life-cycle perspective to help the young to consider a long-time horizon and to think about the future consequences of their decisions. In addition to the booklets, ANGLE focuses on creating a board game that helps the young to improve their financial and economic skills through active involvement and participation. Reading the booklets is an excellent preparation for playing the game. Also for readers who do not play the game, however, they help to make people more conscious and skilled in making important economic and financial decisions.

The booklet has been realised by Tarmo Valkonen of **ETLA**

Realised with the financial support of the European Union – **Erasmus+** programme

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Co-funded by the Erasmus+ Programme of the European Union

Booklet 4

A ROOF OVER YOUR FUTURE
Buying or renting a house

Housing choices cannot be avoided, since everyone must live somewhere. The typical choice after leaving the childhood home or student residence is to rent a flat. In the longer term, however, another choice will become available: to buy a flat or house for your personal use. This normally requires saving for one's own financed share, taking out a housing loan, and committing oneself to a long period of saving afterwards. The purchase of a flat or house is for many the most significant economic decision of their lives.

The idea of this booklet is to guide you through the relevant issues that a student needs to know when deciding whether to live in a rented flat or to start to plan for buying a home. In addition, the financing of the housing investment has many details worth knowing. We will follow the story of a young couple that has these choices ahead of them.

Introducing Daniel and Eva

Daniel is a 24-year-old student expecting to qualify as a nurse in a few months. He lives comfortably with his parents but also longs for the independence and status that living in his own home would provide. He knows that the wages of nurses are not very high but that getting a job in his hometown is rather easy. His long-time girlfriend, Eva, studies medicine too, but she aims to become a doctor and thus continue her studies for two more years. Eva, who lives in a small student flat near the university, has also started to consider the pros and cons of moving out.

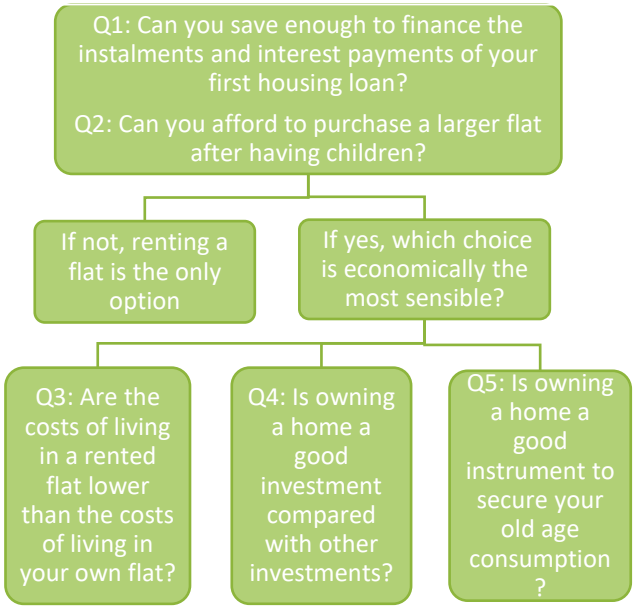
The couple has tentatively discussed living together, but they have not yet made a final decision. They chose first to consider the economic issues related to either renting a flat or starting to save for their own flat. For a young couple

such as Eva and Daniel, the first home is likely to be a flat, but the issues discussed later are equally relevant to the purchase of a house.

We base our story on five key questions that Eva and Daniel must consider when they make their housing choices.

The key questions

Eva and Daniel asked the opinions of their parents and friends about the relevant issues. Going along with the advice they received, they started to search suitable flats with reasonable prices or rents. After following the rental market and housing prices for a while, they found out the obvious fact that flats that are in good condition and in popular areas have either high prices or high rents. There were also plenty of choices available. They concluded that it is unlikely that the flat itself would be the key to the choice between renting or buying.



The first of the key questions is whether they can afford to buy a flat (Q1). If not, renting is the only option. Answering the affordability question requires an estimate of their expected yearly income and expenditures and the costs related to the loan. Moreover, they must assess the expected changes and risks related to their future income and expenses. One of the expected relevant issues is how having children would change their affordability calculation (Q2). If the answer is yes to the affordability question, they must still decide whether buying or renting is the more sensible solution economically.

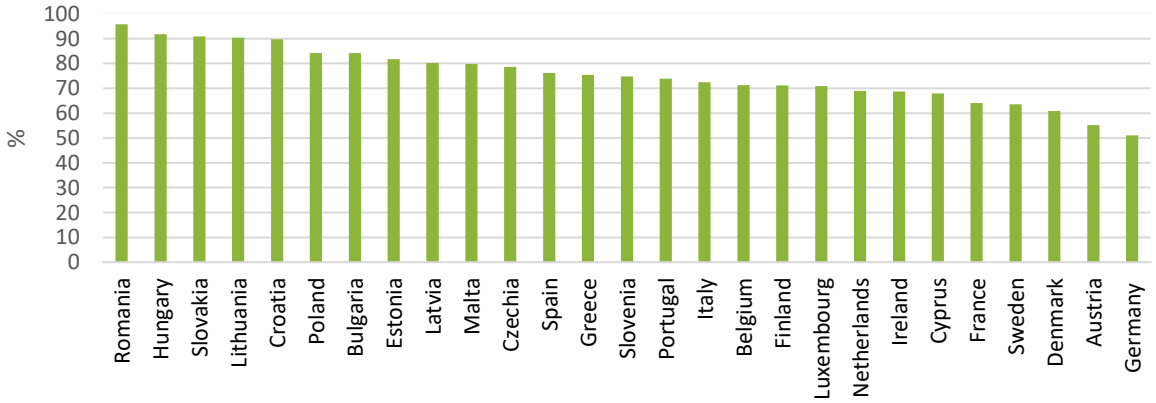
The third question is therefore whether it is cheaper to live in a rented flat or in one's own flat (Q3). Answering this question requires the comparison of rents with the costs that must be paid for one's own flat. The fourth question acknowledges that one's own flat is not only a place to live, but also a large

investment. More precisely, is buying a flat for one's own use a good investment compared with, for example, common stocks or bonds (Q4)?

Closely linked to this issue is whether a housing investment is a good instrument to secure old age consumption (Q5). Eva and Daniel have been advised by their parents on the need to save for old age if they plan to keep up the same living standards as during their working years. They understand that buying a flat could be part of their preparation for old age, since it provides housing for a lifetime and is an asset. If they choose to rent a flat, they must save for old age and invest, in any case, a corresponding sum in financial products. Therefore, they must compare the investment in their own flat with other means of saving for the phase of life in which at least part of their wealth is potentially used for old age consumption.

Eva and Daniel started to understand that answering all these questions might not be so easy, but they decided to continue their endeavour.

Figure 1 Share of persons living in an owner-occupied dwelling in 2019



Source: Eurostat, EU Statistics on Income and Living Conditions (SILC) survey.

Q1: Are Eva and Daniel able to save enough to finance the instalments and interest expenses of a home loan?

Eva and Daniel started to plan their long-term housing choices with an evaluation of their future combined income and expenditures. They immediately noticed that Eva's graduation would markedly enhance their incomes, which led to a common understanding that the final housing choice should be postponed a while. Since they, however, wanted to live together,

renting a flat as soon as Daniel got a job was the only option. Luckily, Daniel had been a trainee at the local hospital and was likely to be hired soon after graduation.

The couple first evaluated their income and expenditures before Eva's graduation. The result of summing up Daniel's after-tax wages and Eva's student allowance was €24,000. Except for the rent, living together turned out to be less costly than living apart. Still, saving markedly for their own flat would mean extremely tight rules for daily expenditures, since their previous total housing costs included only the supported rent of Eva, and they must now pay the much higher market rent for a bigger flat. They therefore adjusted their expenses to the income of €24,000. In their saving plan, the year before the graduation is marked as year 0.

Year	Saving plan			
	Yearly after-tax income	Yearly expenditure	Saving for a buffer fund and a car	Saving for the flat
0	24,000	24,000	0	0
1	60,000	24,000	12,000	24,000
2	5,000	2,000	1,000	2,000

After Eva's graduation (year 1), their total yearly income after tax was expected to jump to €60,000. The couple had, however, plans to save yearly €12,000 for a buffer fund and a car. They estimated that the yearly savings for a flat would climb to €24,000, which sounded like a nice amount of money. Since the money is saved in a bank account, the interest income is so low that they did not take it into account in their savings plan. After purchasing the flat, their expenses would decline by the difference between the rent and the expected maintenance costs, which would allow them to upgrade their living standards.

They also considered the possibility of asking for financial help from their parents, but agreed that it would not be sufficient to influence their affordability calculation. Another factor to consider was their current assets and debts. On the one hand, they had earned some money from temporary jobs, part of which was saved in their bank accounts. On the other hand, Eva had taken out a small student loan. The couple neglected, however, these minor sums, just to simplify the calculation.

Eva and Daniel learned that using the purchased flat as collateral for the loan is very common and that this type of housing loan is called a mortgage loan, or just a mortgage. Because it is unlikely that the mortgage would fully cover the purchase price of the flat, they needed to save for the self-financed share.

It seemed that the share that banks normally require before granting a mortgage is about 10% of the value of the flat.

The next step was to estimate the size of an affordable mortgage. Besides the size of the loan, Eva and Daniel had to consider the loan period, interest rates, the sizes of the yearly repayments of the principal of the loan, and the additional cost charged by the bank. They wanted to avoid risks related to variation in the interest rates and asked several banks for tenders for fixed-rate mortgages only. The alternative would have been a variable-rate mortgage, whose interest rate is composed of a reference market interest rate and a fixed margin set by the bank.

Since various banks seemed to offer mortgages with different terms, the couple had to find the mortgage with the lowest total costs and which best fit their expected saving capability. Eva and Daniel started the comparison of the loan tenders. The most promising two loan tenders for a loan of €200,000 and a 10-year loan period were provided by Bank 1 and Bank 2 (see table below).

LOAN

Collateral is an asset that will be transferred to the lender if the loan is not paid back.

A **mortgage loan** is a housing loan where the flat is used as the collateral.

The **self-financed share** is the share of the purchase price that must be financed by own savings.

The **loan period** is the time from receiving the borrowed amount to the final repayment of the principal of the loan.

The **principal of a loan** is the remaining sum to be paid back.

A **loan with equal principal payments** is a loan where the repaid shares of the principal are equal, but the amount of interest paid varies.

A **loan with equal total payments** is a loan where the yearly sums of the repaid share of the principal and the paid interest are equal.

A **fixed-rate mortgage** is a housing loan where the interest rate is the same during the whole loan period.

Bank 1	Bank 2
The initial fixed costs are 1% of the value of the mortgage and the fixed interest rate charged for the mortgage is 2.2%. The mortgage will be repaid using **equal principal payments**. The yearly interest payments are large at the beginning of the loan period and decline as the remaining principal diminishes with time.	The initial fixed costs are 1.5% of the value of the mortgage and the fixed interest rate is 2%. The mortgage will be repaid using **equal total payments**. This means that the composition of the repayments varies in time so that the proportion of principal repayments is smaller at the beginning but increases with time.

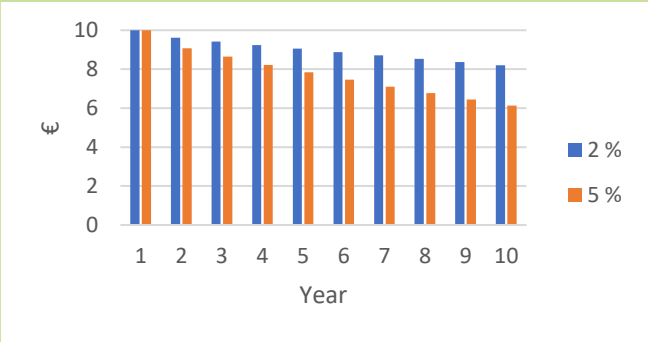
The comparison of the offers was somewhat complicated. Eva and Daniel had to compare sums of different sizes in different years in the future. The solution to this problem is to use discounting, which provides the present value of the stream of payments in the future. The idea is that money in hand is more valuable today than it is in the future, and the interest rate used in the discounting measures the change in value.

There is no general rule for the choice of the discount rate, but often some market interest rate is used, since it describes the true potential of receiving an additional amount of money next year, if the money is invested and not spent this year. On the other hand, for an impatient person, the market rate may be too low for saving and lucrative for borrowing. People sometimes base the comparison of loans on the total interest payments without discounting. This method is feasible only in the case of zero interest rates for both the debt and savings during the whole loan period.

DISCOUNTING

Discounting is a method of determining the current value of payments that take place in the future. The **present value** is the current value of the discounted future payment. For example, if the yearly discount rate is 2% (in calculations, the percentage is always divided by 100, that is, in this case it is 0.02), the present value of the €10 paid next year is 10/(1 + 0.02), which, rounded to the nearest whole cent, is €9.80. If the €10 are paid two years from now, the present value is 10/((1 + 0.02)*(1 + 0.02)), which gives a rounded amount of €9.61. Correspondingly, the present value of a sum that is paid 10 years from now is $10/(1 + 0.02)^{10}$, which has a rounded value of €8.20.

Present value of €10 received in different years in the future for two discount rates



More generally, the formula for discounting is $PV = FV/(1 + r)^t$, where PV is the present value, FV is the future value of the amount that is paid/received t years from now, and r is the discount rate.

Eva and Daniel chose to make the first calculation using a discount rate of 2% per year. They made an Excel spreadsheet to illustrate the two choices and to calculate other possible options later. The payment schedules allocate the yearly repayments of the principal and the interest to the end of each year. Since the couple planned to buy the house at the end of year 1, the first total payment comprises the €2,000 fixed cost of the bank. The payment of interest expenses and the repayment of the loan starts at the end of year 2. The repayments of the principal are fixed at €20,000 in the case of a mortgage from Bank 1. The total payment declines gradually with time. The discounted sum of the payments is €200,073.

Calculating the payment schedule for the equal total payments loan from Bank 2 was more complicated. Eva and Daniel used the bank's online calculator to determine the required amounts. The present value of the payments to the bank would be €199,078, which is lower than in the offer of Bank 1.

Year	Bank 1				
	Balance owed	Principal payment	Interest payment	Total payment	Discounted value
1	200,000	0	0	2,000	2,000
2	180,000	20,000	4,400	24,400	23,453
3	160,000	20,000	3,960	23,960	22,578
4	140,000	20,000	3,520	23,520	21,729
5	120,000	20,000	3,080	23,080	20,904
6	100,000	20,000	2,640	22,640	20,104
7	80,000	20,000	2,200	22,200	19,326
8	60,000	20,000	1,760	21,760	18,572
9	40,000	20,000	1,320	21,320	17,840
10	20,000	20,000	880	20,880	17,129
11	0	20,000	440	20,440	16,439
Present value					200,073

Eva and Daniel noticed that the total discounted costs of the loans were not very different from each other, which was not a big surprise, since there is intense competition between the banks in the area. They also used different discount rates to test the sensitivity of the result, but the costs of Bank 2 were always lower. The couple also noticed that the profile of having higher total payments at the beginning of the loan period, as in the offer from Bank 1, did not fit well with their ability to save. Therefore, their choice was to use the offer of Bank 2 as a basis for their affordability calculations.

The next step was to compare the yearly amounts of their planned savings to see whether they could afford to take on the mortgage. At the end of the first year, they would have total savings of €24,000. They planned to take out a mortgage of €200,000 and buy the flat at that time. Together with the required

10% self-financing share, they could buy a flat with a maximum purchase price of €222,220. The self-financing share would then be €22,222. They also would have to pay a fixed cost of €3,000 for the mortgage. That meant that the total net savings would be –€1,222 at the end of the first year, which would have to be covered from their buffer fund. After that, there would be a surplus that would increase the total net savings every year.

Year	Bank 2				
	Balance owed	Principal payment	Interest payment	Total payment	Discounted value
1	200,000	0	0	3,000	3,000
2	181,735	18,265	4,000	22,265	21,401
3	163,104	18,631	3,635	22,265	20,981
4	144,101	19,003	3,262	22,265	20,570
5	124,718	19,383	2,882	22,265	20,166
6	104,947	19,771	2,494	22,265	19,771
7	84,780	20,166	2,099	22,265	19,383
8	64,211	20,570	1,696	22,265	19,003
9	43,229	20,981	1,284	22,265	18,631
10	21,829	21,401	865	22,265	18,265
11	0	21,829	437	22,265	17,907
Present value					199,078

The outcome of the affordability calculation is that Eva and Daniel can take out a mortgage of €200,000 if there are no surprises in how much they can save. They will even accumulate some net savings that can be used as a buffer for unexpected expenditures. This calculation does not consider the deductibility of interest expenses in taxation, which is in force in several European Union (EU) countries. If that is considered, they might be able to afford an even higher mortgage.

Year	Affordability calculation			
	Yearly loan payments	Self-financing share	Yearly savings	Cumulative net savings
1	3,000	22,222	24,000	-1,222
2	22,265		24,000	513
3	22,265		24,000	2,247
4	22,265		24,000	3,982
5	22,265		24,000	5,717
6	22,265		24,000	7,451
7	22,265		24,000	9,186
8	22,265		24,000	10,921
9	22,265		24,000	12,656
10	22,265		24,000	14,390
11	22,265		24,000	16,125

Eva and Daniel also considered the uncertainties related to affordability. It is conceivable that getting a new job after becoming unemployed would require moving to another city. Selling the flat and buying a new flat would incur additional costs. This is a risk that can be avoided only by renting a flat instead of buying one, but that could generate other problems, such as the difficulty of finding a suitable flat.

As mentioned earlier, Eva and Daniel both have occupations that are likely to mitigate the risks of not finding jobs after graduation and becoming unemployed later. They are also healthy and do not expect long sickness leaves that would reduce their earnings. In addition, they could take life insurance against the very unlikely case one of them dies. The insurance is cheap, because of the low probability of dying early. Even if a separation seems very unlikely to them, they made a prenuptial agreement just to clarify the ownership of their wealth.

Other risks related to their wage income are likely to be positive. Their wages seem to grow by about 2% each year. If they save the same share of their income in the future, the initial savings of €24,000 will grow by 2% yearly. The possibility of saving is affected also by unexpected expenditures. As mentioned, Eva and Daniel had already taken this into account by adding a 10% margin to their estimated monthly expenditures. They also planned to use insurance to limit the losses in case of accidents.

The example above represents a case in which the mortgage has a fixed interest rate. This means that the bank bears the risk of variation in market interest rates. Therefore, the interest rate Eva and Daniel are charged is higher than the expected average interest rate of a variable-rate mortgage. In this type of housing loan, the interest rate is typically linked to some short-term reference rate and the borrower bears the risk of variation in the mortgage rate.

The ability to bear the interest rate risk can be enhanced, for example, by saving first for a buffer fund or choosing a mortgage with a variable interest rate that allows for extending the loan period if the interest rate increases. Eva and Daniel prefer to avoid the risks related to both the variation of yearly payments and the length of the loan period and therefore chose the fixed–interest rate mortgage.

Q2: What about having children?

Since both Eva and Daniel love the idea of having children, they must consider the consequent breaks in the working careers. The plan is that, for each child, Eva would take a break of 18 months and Daniel would continue with a six-month

childcare period. Assuming two children, the affordability calculation must include four years of lower savings. The couple estimated that possible savings would be halved during these years,[1] resulting in a total loss of €48,000 to their saving plan.

There are at least two possible solutions to the problem: obtain a loan with longer maturity or postpone the purchase of the larger flat until they have saved enough for a higher self-financed share. The couple chose the first option but also noticed that they needed a larger flat because of the children. Therefore, they ended up asking for offers for a loan sum of €240,000 and a loan period of 14 years. With a 10% self-financing share, the maximum purchase price of the flat is €266,667.

It turns out that the offers were similar as the previous ones in terms of loan type, interest rate, and the determination of the fixed costs. Eva and Daniel again compared the discounted sums of the yearly payments of the principal and interest and found that the offer of Bank 2, which provides equal total payments loans, was the better offer for them. Eva and Daniel again used the website calculator of Bank 2 to generate the prepayment schedule. The yearly payments were €19,824, somewhat lower than in the previous case. The fixed costs to be paid at the end of the first year were, at the time, €3,600 (1.5% of the loan sum).

Year	Bank 2			
	Balance owed	Principal payment	Interest payment	Total payment
1	240,000	0	0	3,600
2	224,976	15,024	4,800	19,824
3	209,651	15,325	4,500	19,824
4	194,019	15,631	4,193	19,824
5	178,075	15,944	3,880	19,824
6	161,812	16,263	3,562	19,824
7	145,224	16,588	3,236	19,824
8	128,304	16,920	2,904	19,824
9	111,045	17,258	2,566	19,824
10	93,442	17,604	2,221	19,824
11	75,486	17,956	1,869	19,824
12	57,172	18,315	1,510	19,824
13	38,490	18,681	1,143	19,824
14	19,436	19,055	770	19,824
15	0	19,436	389	19,824

They made a new affordability calculation assuming that the first child would be born in year 6 and the second in year 11. The first-year savings were again needed to finance the 10% own-financed share of the purchase price of the apartment (€26,667). The first-year balance of –€6,267 shows that they would have to postpone the purchase of the car and use these other savings to finance the initial expenditures.

1 Actually, the loss is larger during the year that Eva takes care of the children, because of her higher wage, and smaller in the divided childcare years, but this does not essentially change the affordability calculation if the average is €12,000 per year. The calculation also considers the family benefits Eva and Daniel will receive.

Moreover, the sums saved during the childcare years (years 6 and 7 and 11 and 12) would not be high enough. The balance of cumulative savings shown in the last column would be negative only for some of the years in the future. Given that Eva and Daniel's wages are likely to grow yearly, these shortfalls are not likely to become a problem. This new plan confirms that they can afford both having two children and buying the flat. This calculation was made assuming that the interest rate is zero for the cumulative balance of total net savings, but a small positive number would not essentially change the saving plan.

Year	Affordability calculation			
	Yearly loan payments	Self-financing share	Yearly savings	Cumulative net savings
1	3,600	26,667	24,000	-6,267
2	19,824		24,000	-2,091
3	19,824		24,000	2,084
4	19,824		24,000	6,260
5	19,824		24,000	10,435
6	19,824		12,000	2,611
7	19,824		12,000	-5,214
8	19,824		24,000	-1,038
9	19,824		24,000	3,137
10	19,824		24,000	7,313
11	19,824		12,000	-512
12	19,824		12,000	-8,336
13	19,824		24,000	-4,161
14	19,824		24,000	15
15	19,824		24,000	4,190

Q3: Is it cheaper to live in a rented flat or to buy one?

Eva and Daniel had heard from their friends that renting a house means giving away money to the landlord and that paying the costs of your own flat means that you benefit from the payments. However, following this kind of rule of thumb is not always the best way to make informed decisions.

The simplest way to determine the difference is to compare the market rents of a given type of flat to the costs of living in a similar owned flat. The information is not, however, easily available, since the flats must be identical. For example, the maintenance costs, such as small repairs, are likely to be lower in younger flats. Luckily, Daniel's uncle, Peter, owns and rents out several flats and is therefore likely to be familiar with the details. Hence, the couple asked for help with the comparison.

Peter happily agreed and said that he had a very good example for them, since he rents out a flat that is exactly similar to the one in which he lives. Both are financed with a loan and have similar maintenance costs and property tax to be paid. The only expenditure that differs is that Peter must pay tax on the net rental income that he receives. Since this tax increases his costs, he adds it to

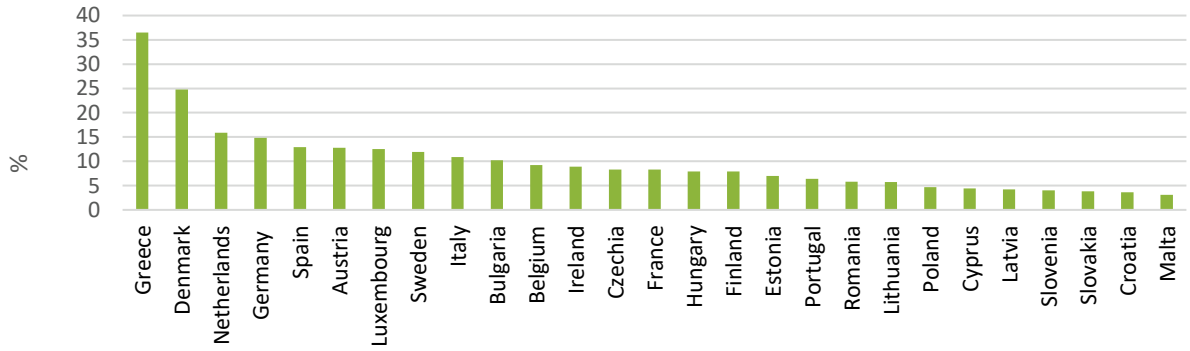
the rent. Therefore, renting a flat is more costly by the amount of tax paid, which is less than Eva and Daniel initially thought.

Additional country-specific issues to be considered in the comparison of costs

In many countries, there are flats with a lower rent or a housing allowance for low-income people, which can change the outcome of the comparison. In our case, Eva and Daniel are well off and not eligible for this kind of subsidy. Another issue is that the interest expenses for a landlord are deductible in taxation, but this is not the case in all EU countries for persons who live in their own flat. There are also country-specific deviations from the main rule that the right to live in your own flat is not taxed, and the property tax on an owner-occupied flat can differ from the property tax on a rented flat.

Figure 2 Housing cost overburden rate for 25- to 29-year-olds

The housing cost overburden rate is measured as the share of households that spend 40% or more of their disposable income on housing. This figure is higher for those who are starting their working career, due to their lower incomes, and typically highest for tenants who pay market rents.



Source: Eurostat, EU-SILC survey.

Q4: Is buying a house for yourself a good investment?

The next notion that Eva and Daniel often ran across is that, in addition to providing the necessary housing services, an owner-occupied flat is a good investment because of the continuous increase in housing prices. However, as the experience from the cost comparisons shows, this kind of belief must be taken with a grain of salt. The previous consultation with Peter increased the couple's confidence in his knowledge. Hence, they asked for his advice in this case as well.

COMPARING INVESTMENTS

The **expected yield** is the average yield expected from an investment in the future. It is often approximated by the previously realized rate of return on similar investments. The expected yield can be divided into the running yield, which provides the yearly income, and a change in the market price of the investment.

Investment risks can be related to the variation of the yield or lower-than-expected average yield.

Liquidity measures the ease with which an investment can be converted into cash without accepting a price that is lower than the market price.

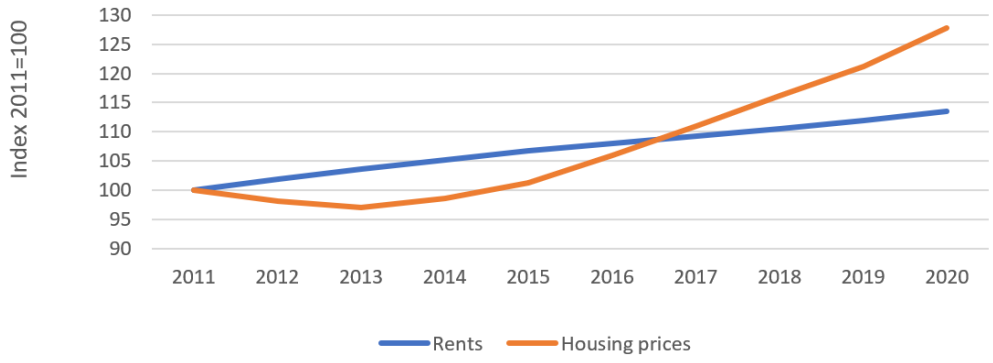
The key properties to be used to compare various investments are the expected yield, the investment risks related to the variation in the yield, and liquidity. Liquidity can be measured, for example, by the time it takes to sell the flat, or the discount that must be given in comparison with market prices if the sale is speeded up.

Eva and Daniel started first to estimate the expected yield from an owner-occupied house. They noticed that one must first give a market price for the benefit of being able to live in their own home. Since the alternative is to live in a rented flat, the market rent of a corresponding flat provides one possible value for the price of the benefit. Therefore, the running yield can be calculated by deducting the maintenance costs and the real estate tax from the market rent of a corresponding flat and dividing the remainder by the market price of the flat.

Another element of the expected yield is the increase or decrease in house prices. Here Peter advised that the value of a house in cities is strongly affected by land prices. If the area is popular, there is the possibility of gaining in the long term, but in areas with migration losses, the expected change in house prices is negative. These expectations influence current prices. Regarding the risks of a housing investment, it seems that rents have an upward trend but are not likely to vary very much. In addition, the variation in housing prices is lower than for stock market prices. Realization of the price risk also requires that the

couple sell their own flat when housing prices have generally fallen and do not buy a new one under the prevailing low prices.

Figure 3 Rents and housing prices in the EU



Source: Eurostat.

On the other hand, the flat will be the largest single asset during the lifetimes of Eva and Daniel. There is also the saying warning against putting too many eggs in the same basket. Translated into the language of expected yields and risks, it says that a well-diversified portfolio can have the same expected yield with lower risks related to variation in the yield. A housing investment limits the possibilities of a more diversified portfolio. One of the issues is whether the affordability risks and investment risks are correlated. In bad economic times, unemployment risk is high and stock market prices and housing prices are low. The correlation of the risks can be reduced by investing in riskless assets, but then the average yield declines.

How taxation influences the choice between housing investment and other savings

As noted previously, the benefit of living in one's own flat or house is not taxed directly in most countries. Moreover, the capital gain due to the potentially increased price when selling the flat is normally not taxed. A property tax applied to residential buildings or land is, however, quite common. Still another tax that must often be considered is a transfer tax, which is paid by the buyer in the case of the purchase of the flat. The influence of taxation on the choice between buying and renting a flat is highest in countries where capital income taxes are highest and mortgage interest rates can be deducted from taxable income.

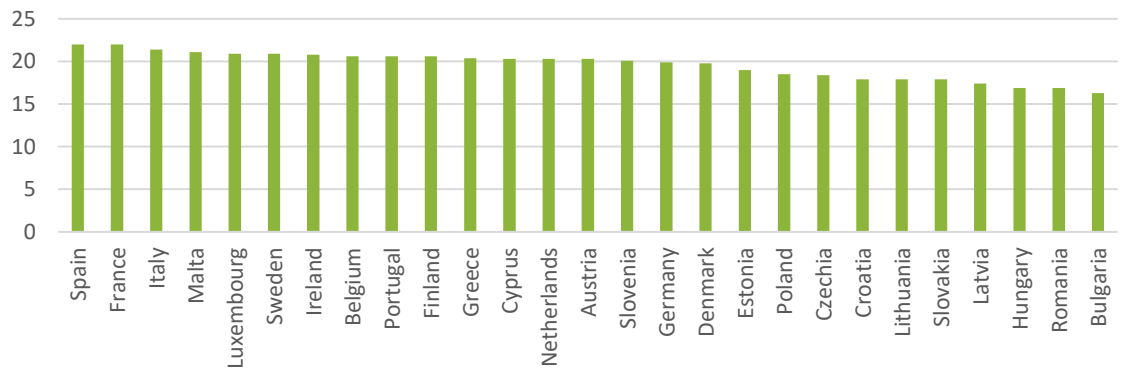
To sum up, a housing investment is likely to generate a moderate but a rather stable yield compared to, for example, the performance of investments in the

stock market. However, since a house represents the largest investment for individuals by far, it limits the opportunities for risk diversification. For Eva and Daniel, the lenient taxation of owner-occupied housing explained in the information box above is likely to be the single most important factor supporting purchasing a flat of their own instead of renting one.

Q5: Housing investment and old age consumption

Eva and Daniel attended Eva's family reunion and noted that four generations were present. Eva's grandparents said that this is the first time this has happened. The phenomenon illustrates well how life expectancies have lengthened. Economically, this means that people must prepare to live at least 20 years after retirement.

Figure 4 Life expectancy at age 65 in 2019

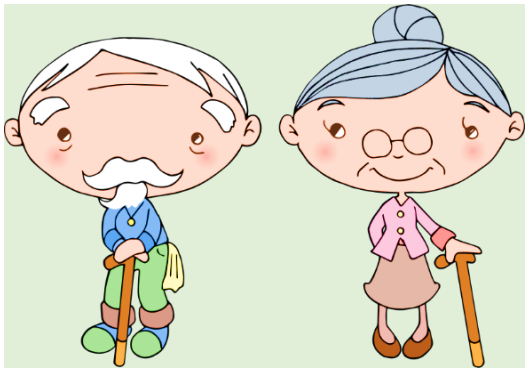


Source: Eurostat.

The main income source in retirement years is typically pensions, but these are often not high enough to compensate for the lost labour income and to avoid a drop in consumption possibilities. Living in an owner-occupied home lowers the housing cost and thus helps to maintain the consumption level. It also provides an asset that can be realized to add to purchasing power.

There are many ways to use home equity. Typically, the size of the home is rather big compared with the number of persons living there after the children have left and sometimes also after a divorce or death of a spouse. One obvious way of converting part of the value of the home to consumption is to move to a smaller house or flat or sell it and rent a smaller place.

Another possibility is to use the value of the home as collateral for a consumption loan. These reverse mortgages are often designed so that there is no loan amortization, and the accrued interest and principal are paid when the loan period ends, or the owner sells the flat, or dies. In most countries, the market for reverse mortgages is not well developed, and there are therefore good reasons to check whether the interest rate and other costs that are charged are reasonable. The interest rate can be fixed or variable. There are also many different types of products in terms of monthly sums and loan periods.



If there is a lump sum payment for the full sum at the beginning of the loan period, the total interest payment of the loan can be high. On the other hand, a lump sum payment allows one to reinvest the principal and flexible use of the money, which can be useful, for example, in case of unexpected health costs or costs for long-term care. The monthly payments can also be fixed during the loan period. Finally, the loan period can be fixed for a given number of years or the borrower can receive payments as long as she or he is alive.

Risk sharing influences the costs of reverse mortgages. If the interest rate is fixed, it is higher than the expected average of the future yearly short-term reference interest rates, because the bank bears the interest rate risk. Furthermore, if the payments are provided as a lifetime annuity, the bank takes on the risk that the borrower will live a very long time and selling the house will not cover the loan principal and accrued interest. Therefore, the monthly annuity payment is smaller than that calculated using average expected lifetimes. Since the lender also bears the risks related to variation in housing prices, the maximum principal of the reverse mortgage loan is likely to be markedly lower than the current market value of the home.

Exercise

a) How would Eva and Daniel's initial affordability calculation change if the interest expenses can be deducted fully from taxed income and the income tax rate is 30%?

b) Let us assume that two friends are aiming to buy identical flats in the same building and live there. How would income and expenditures change if they rented their apartments to each other?

c) What happens to rents when capital income tax rates increase?

d) If housing prices first increase by 10% and then decline by 10%, are the prices the same, higher, or lower than before the prices changed?

e) Global warming and the actions aimed to prevent it are likely to influence housing costs. Try to find reasons why the costs could increase.

f) Use the equation below to calculate the yearly total payment from an equal total payment loan of €240,000 with a loan period of 14 years and an interest rate of 2%. The formula for the calculation is

$$A = \frac{N \times (1+r)^T \times r}{(1+r)^T - 1}$$

where *A* is the amount of each equal payment, *N* is the amount of the mortgage, *T* is the loan period, and *r* is the interest rate.

Answers

a) The after-tax interest expenses would decline by 30%, which corresponds to a situation in which the interest rate declines from 2% to 1.4% (0.7 x 2% = 1.4%).

b) Both must pay capital income tax for the rental income.

c) Rents increase since the owner must pay taxes on rental income.

d) The prices are lower.

e) Climate change increases the average outdoor temperature, which limits the need for warming, but increases the need for cooling. The prices of fossils fuels as well as the prices of home insurances are likely to increase.

f) The yearly payment is the same as for Eva and Daniel buying the larger flat.

$$yearly\ payment = \frac{240{,}000 \times (1+0.02)^{14} \times 0.02}{(1+0.02)^{14} - 1} = 19{,}824.47$$

THE MAIN ISSUES

- The facts related to housing choice are important, because everyone must live somewhere, and the purchase of a home is one of the largest financial decisions that individuals are likely to make.

- The affordability of a mortgage is typically most challenging at the beginning of one's working career, especially if the first yearly payments of the mortgage are higher.

- Society often provides support for low-income people in terms of low-rent apartments or housing allowances. Eligibility for these can well mean that renting a flat is financially the best choice.

- On the other hand, society supports home ownership in terms of taxation. The most typical tools are exempting the benefit of living in one's own flat (sometimes called imputed rent) from taxes and leaving the capital gains on owner-occupied principal residences untaxed. Correspondingly, a landlord's net rental income and capital gains are taxable.

- A landlord's interest expenses are tax deductible, but the tax treatment of the interest expenses of a mortgage varies between countries, which can influence the comparison between housing costs.

- The lenient tax treatment of owner-occupied housing also makes the purchase of one's own home a good investment for old age, presuming that the flat or house is situated in an area where the housing prices are likely to increase.

- Owning a flat or a house at the time of retirement means that the costs of living in old age will be lower and that there is also the possibility of converting part of the value of the home to consumption by using it as collateral for a reverse mortgage.

Realized with the financial support of the European Union - Erasmus+ project n. 2020-1-IT02-KA203-079758

Co-funded by the Erasmus+ Programme of the European Union

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